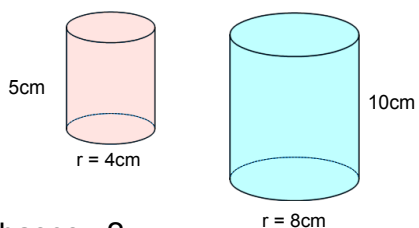


12.7 Explore Similar Solids

Similar solids--same shape, but not necessarily the same size

All spheres are similar.

For other solids:
 Bases must be similar and other corresponding lengths must be proportional.



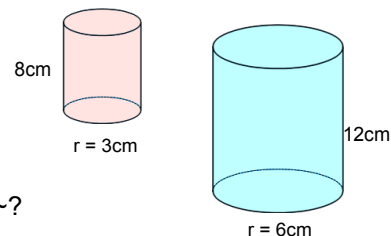
ex 1:

Are the bases ~?

yes

Scale factor? $1:2$

Are other lengths proportional?

 $1:2$ yes

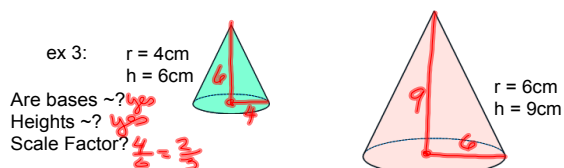
ex 2:

Are the bases ~?

yes

Scale factor? $1:2$

Are other lengths proportional?

 $\frac{1}{2} \neq \frac{8}{12}$ no

ex 3:

 $r = 4\text{cm}$
 $h = 6\text{cm}$

Are bases ~?

yes

Heights ~?

yes

Scale Factor?

 $\frac{4}{6} = \frac{2}{3}$

Find the following for each figure and compare the ratios to scale factor.

	small	large
l	$2\sqrt{13}$	$3\sqrt{13}$
C	8π	12π
B	16π	36π
LA	$\frac{1}{2} 8\pi \cdot 2\sqrt{13} = 8\pi\sqrt{13}$	$18\pi\sqrt{13}$
SA	$\frac{1}{2} 16\pi \cdot 6 = 48\pi$	108π
V	$\frac{1}{3} 16\pi \cdot 6 = 32\pi$	108π

Theorem 12.13--If the scale factor of 2 ~ solids is $a:b$, then:

1. The ratio of corresponding areas is $a^2:b^2$
2. The ratio of corresponding volumes is $a^3:b^3$

Ex:

The scale factor of 2 cones is 5:6.

What is the ratio of:

P $5:6$ LA $25:36$ SA $25:36$ V $125:216$ l $5:6$ r $5:6$ If the LA of smaller is 100π ,
what is LA for the larger?

$$\frac{25}{36} = \frac{100\pi}{x} \quad (144\pi)$$

If the V of smaller is 86.4π ,
what is V for the larger?

$$\frac{125}{216} = \frac{86.4\pi}{V}$$

$$V = 199.3\pi$$

Ex:

Two solid metal cylinders are similar.

radius of 1st = 10cm

radius of 2nd = 14cm

What is the scale factor? $5:7$ If the smaller cylinder weighs 2.5 kg,
how much does the larger one weigh?

$$\frac{125}{343} = \frac{2.5}{V}$$

$$6.86 \text{ kg}$$

Ex:

Two similar pyramids have LA = 12cm^2 and
LA = 27cm^2 .

$$\frac{12}{27} = \frac{4}{9} \text{ LA}$$

What is the scale factor? $(\frac{2}{3})$ If the volume of the smaller is $V = 20\text{cm}^3$,
what is the volume for the larger?

$$\left(\frac{2}{3}\right)^3$$

$$\frac{8}{27} = \frac{20}{V}$$

$$67.5\text{cm}^3$$

Ex:

Two similar prisms have LA = 27cm^2 and LA = 75cm^2 .What is the scale factor? $\frac{3}{5}$ If the volume of the smaller is $V = 121.5\text{cm}^3$, what is the
volume for the larger?

$$\frac{27}{125} = \frac{121.5}{V}$$

$$262.5\text{cm}^3$$

Is this cylinder ~ to the cone?

No

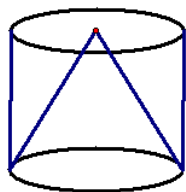
Cylinder Volume = $36\pi u^3$

Cone Volume = ? *$12\pi u^3$*

$$V = Bh$$

$$V = \frac{1}{3}Bh$$

$$\frac{1}{3} 36\pi$$

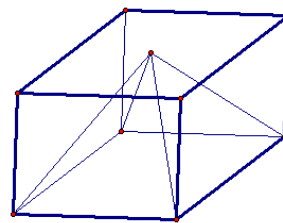


Pyramid Volume = $9 u^3$

Prism Volume = ?

$$27 u^3$$

$$9 \times 3$$



HW

p850-851

3-6, 8, 9, 11-15, 19